

# *U.S. Antarctic Marine Living Resources Program*

## *2013/2014 Weekly Field Reports*

### *Cape Shirreff, Livingston Island*

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#### Science Report

##### Seabirds

1. It is approximately three weeks since peak hatching for both gentoos and chinstraps. We started weighing 21-day old chicks on 14 January to determine their condition at crèche. To date, of the 50 gentoo reproductive success study nests, 42% are brooding two chicks, 28% are brooding one chick, and 30% have failed. Similarly, of the 100 chinstrap reproductive study nests, 33% are brooding two chicks, 39% are brooding one chick, and 28% have failed. None of our monitored birds have begun to crèche yet.
2. We continue to monitor known-age penguins. Forty-two gentoo penguin nests have 16.7% brooding two chicks, 47.6% brooding one chick, while 35.7% have failed. The 39 known-aged chinstraps are doing slightly better, with 30.8% brooding two chicks, 43.6% brooding one chick, while 25.6% have failed.
3. We have completed the deployment of radio transmitters on penguins (19 on chinstraps, 18 on gentoos) to measure foraging trip durations during the chick-provisioning period. These instruments will remain on the birds until the end of the breeding season when they will be lost during the annual molt.
4. We have currently retrieved seven out of eight bio-logging instruments (satellite transmitters and time-depth recorders) deployed on chinstraps, and three out of eight instruments deployed on gentoos.
5. We continued sampling the diets of penguins using the wet offloading technique. To date, we have collected samples from 15 chinstrap penguins and 10 gentoos. We record total mass of stomach contents, diet composition, and length /sex frequency of krill for each sample. Chinstrap penguin diet samples have been entirely Antarctic krill (*Euphausia superba*) with trace amounts of fish. Gentoo penguin diet samples were a mix of Antarctic krill and fish.
6. We continue to monitor Brown skua territories. One territory is only monitored opportunistically when we are able to make the trek over to the far south west side of Cape Shirreff. Currently, we do not know the status of that nest. However, of the 21 territories that are regularly monitored, 10 are brooding chicks, 10 have failed, and one has re-laid and is still incubating an egg.



## Pinnipeds

7. We still have 11 female fur seals instrumented with time depth recorders (TDR) for monitoring at-sea foraging behavior and diving. Five of the 11 have GPS-TDRs that record location at one hour intervals. Those five have all completed six trips, while four of the six females that have standard TDRs have completed six trips. We will leave these instruments on through January to record at-sea foraging behavior.
8. Twenty-two of our 30 CCAMLR attendance females have completed six trips to sea. Four females have completed nine or more trips. To date, four of our attendance females have lost their pups before completing six trips.
9. Eighteen of the pups of the 22 females that have completed six trips to sea have been weighed according to protocol. Mean mass gain from the start of female foraging cycles to completion of the sixth trip suckling bout is 143.0 g/d (s.d. = 25.4; n = 18; range: 108.2 - 195.4).
10. We continue to monitor our adult tagged female population and mother pup pairs to get a measure of reproductive success and loss of pups due to leopard seal predation. Pups are now actively playing and swimming near shore where they are easily accessible to leopard seals. Our current estimate for pup loss to leopard seal predation as of yesterday (19 January) is 23.5%.
11. This week we started collecting our fifth fur seal diet sample of ten scats. To date 50 scats have been collected and 43 have been processed.
12. On 17 January we completed our ninth weekly Cape-wide Phocid census. We noticed an increase in elephant seals as females have started to return to molt. We counted 243 elephant seals on the Cape.
13. This week we continued our study to describe leopard seal foraging behavior and study their impact on fur seals and penguins. We have now deployed four GPS/TDRs, and two CRITTERCAM systems in conjunction with diet sampling. We have recovered three of the GPS/TDR systems and one CRITTERCAM. The CRITTERCAM recorded over eight hours of HD video footage and revealed some exciting never-before filmed behavior (stay tuned!).
14. We continue to operate the APH-22 hexacopter to photograph individual leopard seals and to map/census penguin colonies. Despite windy wet conditions, we managed to fly on two afternoons this week. We obtained full coverage of three leopard seals of known length and mass. Initial analysis indicates that aerially derived measurements are within 0.5% of known values for standard length.



## Weather

15. The weather has been a bit warmer and wetter this week. Winds averaged 9.9 mph with a maximum wind speed of 44 mph. Winds have been evenly distributed between westerlies and easterlies. The average temperature was 1.2°C with a high of 5.2°C and a low of -1.1°C. Mean daily solar radiation was 15,470 Wm<sup>2</sup>. Sunrise is now at 3:59 am and sunset is at 10:17 pm.

## Camp

16. The camp continues to run smoothly with the help of a lot of elbow grease. This week the interior of the outhouse was scrapped of paint chips and re-painted with mold-resistant paint (Thank you McKenzie!). We also managed to finally clear paths on decking around all of the buildings, and provide access to propane tanks that does not require snow attire.
17. Charging and initial testing has begun on a new power system for the Cape which will be supported by lithium-ion batteries instead of the traditional lead acid type. If successful the system would provide more power more efficiently, and take up less space in our workshop.
18. New door covers continue to be installed/fitted as weather allows.
19. It should be noted that our old Weather Haven insulated tent (circa 1996) is nearing the end of its useful lifetime. The seams have been worn bare and the sealing has become ineffective resulting in leaks and further damage by wind.

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